SEQUENCE LISTING

<110> Ohmiya, Yoshihiro
Nakajima, Yoshihiro

<120> Multiple gene transcription activity assay system

<130> SAEG129.016APC

<140> 10/555,544
<141> 2004-11-04

<150> JP2003-127629
<151> 2003-05-06

<150> JP2003-407564
<151> 2003-12-05

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<170> PatentIn version 3.1

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35 40 45

Ser Tyr Ala Gln Ile Phe Glu Thr Ser Cys Arg Leu Ala Val Ser Ile
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Glu Gln Tyr Gly Leu Asn Glu Asn Asn Val Val Gly Val Cys Ser Glu
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Asn Asn Ile Asn Phe Phe Asn Pro Val Leu Ala Ala Leu Tyr Leu Gly
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Gly His Leu Asn Ile Ser Lys Pro Thr Ile Met Phe Ser Ser Lys Lys
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Lys Val Val Val Ile Asp Ser Met Tyr Asp Ile Asn Gly Val Glu Cys
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Val Ser Thr Phe Val Ala Arg Tyr Thr Asp His Thr Phe Asp Pro Leu
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Ser Phe Thr Pro Lys Asp Phe Asp Pro Leu Glu Lys Ile Ala Leu Ile
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His Arg Ser Leu Thr Ile Arg Phe Val His Ser Arg Asp Pro Ile Tyr
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Gly Thr Arg Thr Val Pro Gln Thr Ser Ile Leu Ser Leu Val Pro Phe
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His His Ala Phe Gly Met Phe Thr Thr Leu Ser Tyr Phe Val Val Gly
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Leu Lys Val Val Met Leu Lys Lys Phe Glu Gly Ala Leu Phe Leu Lys
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Lys Val Leu Asp Asn Ala Thr Gly Lys Ala Leu Gly Pro Gly Glu Arg
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Ser Gly Asp Ile Gly Tyr Tyr Asp Glu Asp Gly Asn Phe Phe Ile Val
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Asp Arg Leu Lys Glu Leu Ile Lys Tyr Lys Gly Tyr Gln Val Ala Pro
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Ala Glu Leu Glu Asn Leu Leu Leu Gln His Pro Ser Ile Ala Asp Ala
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Gly Val Thr Gly Val Pro Asp Glu Phe Ala Gly Gln Leu Pro Ala Ala
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Cys Val Val Leu Glu Ser Gly Lys Thr Leu Thr Glu Lys Glu Val Gln
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Asp Phe Ile Ala Ala Gln Val Thr Pro Thr Lys His Leu Arg Gly Gly
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Val Val Phe Val Asp Ser Ile Pro Lys Gly Pro Thr Gly Lys Leu Ile
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Leu
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gcagttagtc tagaaaaata tggcttggat cataacaatg ttgtggcaat atgcagtgaa 240

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acatcaaatg atatgtacac agaaagggag atgattggcc atttgaatat atcgaaacca 360

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gatcccatct atggtactcg tattgctcca gatacatcaa ttcttgctat agcaccgttc 720

catcatgcct ttggactgtt tactgcacta gcttactttc cagtaggact taagattgta 780

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35 40 45

Ser Tyr Ala Gln Ile Phe Glu Thr Ser Cys Arg Leu Ala Val Ser Leu
50 55 60

Glu Lys Tyr Gly Leu Asp His Asn Asn Val Val Ala Ile Cys Ser Glu
65 70 75 80

Asn Asn Ile His Phe Phe Gly Pro Leu Ile Ala Ala Leu Tyr Gln Gly
85 90 95

Ile Pro Met Ala Thr Ser Asn Asp Met Tyr Thr Glu Arg Glu Met Ile
100 105 110

Gly His Leu Asn Ile Ser Lys Pro Cys Leu Met Phe Cys Ser Lys Lys
115 120 125

Ser Leu Pro Phe Ile Leu Lys Val Gln Lys His Leu Asp Phe Leu Lys
130 135 140

Lys Val Ile Val Ile Asp Ser Met Tyr Asp Ile Asn Gly Val Glu Cys
145 150 155 160

Val Phe Ser Phe Val Ser Arg Tyr Thr Asp His Ala Phe Asp Pro Val
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Lys Phe Asn Pro Lys Glu Phe Asp Pro Leu Glu Arg Thr Ala Leu Ile
180 185 190

Met Thr Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Val Ile Ser
195 200 205

His Arg Ser Ile Thr Ile Arg Phe Val His Ser Ser Asp Pro Ile Tyr
210 215 220

Gly Thr Arg Ile Ala Pro Asp Thr Ser Ile Leu Ala Ile Ala Pro Phe
225 230 235 240

His His Ala Phe Gly Leu Phe Thr Ala Leu Ala Tyr Phe Pro Val Gly
245 250 255

Leu Lys Ile Val Met Val Lys Lys Phe Glu Gly Glu Phe Phe Leu Lys
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Thr Ile Gln Asn Tyr Lys Ile Ala Ser Ile Val Val Pro Pro Pro Ile
275 280 285

Met Val Tyr Leu Ala Lys Ser Pro Leu Val Asp Glu Tyr Asn Leu Ser
290 295 300

Ser Leu Thr Glu Ile Ala Cys Gly Gly Ser Pro Leu Gly Arg Asp Ile
305 310 315 320

Ala Asp Lys Val Ala Lys Arg Leu Lys Val His Gly Ile Leu Gln Gly
325 330 335

Tyr Gly Leu Thr Glu Thr Cys Ser Ala Leu Ile Leu Ser Pro Asn Asp
340 345 350

Arg Glu Leu Lys Lys Gly Ala Ile Gly Thr Pro Met Pro Tyr Val Gln
355 360 365

Val Lys Val Ile Asp Ile Asn Thr Gly Lys Ala Leu Gly Pro Arg Glu
370 375 380

Lys Gly Glu Ile Cys Phe Lys Ser Gln Met Leu Met Lys Gly Tyr His

385 390 395 400

Asn Asn Pro Gln Ala Thr Arg Asp Ala Leu Asp Lys Asp Gly Trp Leu
405 410 415

His Thr Gly Asp Leu Gly Tyr Tyr Asp Glu Asp Arg Phe Ile Tyr Val
420 425 430

Val Asp Arg Leu Lys Glu Leu Ile Lys Tyr Lys Gly Tyr Gln Val Ala
435 440 445

Pro Ala Glu Leu Glu Asn Leu Leu Leu Gln His Pro Asn Ile Ser Asp
450 455 460

Ala Gly Val Ile Gly Ile Pro Asp Glu Phe Ala Gly Gln Leu Pro Ser
465 470 475 480

Ala Cys Val Val Leu Glu Pro Gly Lys Thr Met Thr Glu Lys Glu Val
485 490 495

Gln Asp Tyr Ile Ala Glu Leu Val Thr Thr Thr Lys His Leu Arg Gly
500 505 510

Gly Val Val Phe Ile Asp Ser Ile Pro Lys Gly Pro Thr Gly Lys Leu
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gcagagctgg tcactacaac taaacatctg agggggggggg tcgtctttat agattccatt 1560

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<213> Mutant Phrixothrix Red Luciferase of the Invention

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<212> DNA
<213> Wild Type Rhagophthalmus ohbai Green Luciferase

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attaaagatg ccggtgttac tggcgttccc gacgaagctg ctggagaact accaggtgct 1440

tgtatagttc tccaagaagg aaaaagtctt actgaacaag aaattattga ctatatagcc 1500

gaacgagttt cgccaactaa acgtatacgt ggtggagtgg tcttcgttga tgatattcct 1560

aaaggggcga ctggaaaact ggtcagaagt gaattacgaa aacttcttgc tcagaagaaa 1620

tcgaaactat aa 1632

<210> 9
<211> 1632
<212> DNA
<213> Wild Type Rhagophthalmus ohbai Orange Luciferase

<400> 9
atgcctaatg aaatcatttt acatggggcc aaacctcgag acccgttaga cctgggaact 60

gcaggaattc aattgtatag ggctttgacg aatttttcct ttttaaggga agccttgatc 120

gacgctcaca ccgaggaagt agtatcttac gcggacattt tggaaaacag ctgtcgatta 180

gcaaaatgct acgaaaacta tggattacgc caaaacagcg tcatatcggt gtgcagcgaa 240

aacagcacga tcttcttcta ccccgtaatt gccgctttgt atatgggagt cataacagca 300

accgtaaatg atagttatac cgaacgggaa ttattggaaa ccttaaatat atcaaaaccg 360

gaattagtgt tctgctcgaa gaaagccatt aaaaatatga tggcattgaa aaggaacgtc 420

aattttatta aaaaggtagt acttttggat agtaaggaag acatgggcga agcccagtgt 480

cttagcaact ttatggcacg ctattcggaa cccaatttgg acgtaagaaa ttttaaacca 540

cgcgattttg atgctaaaga acaagtcgct ttgatcatgt cctcatcggg aacaaccggg 600

ctgcccaaag gggtcgtgtt aacccatcga aatttaagcg ttcgcttcgt acactgcaag 660

gatcccttat tcggcaatag aactattcca tcaacttcga ttttatctat cgttcccttc 720

catcatgcgt ttggaatgtt tacaacgttg tcttatttta tagtagggct tagagttgta 780

ttactgaaaa gattcgaaga gaagtttttc ttaagcacca ttgaaaagta cagaattcca 840

actatcgttc ttgcgccgcc cgtaatggta ttcctagcta agagcccctt agttgatcag 900

tacgatttgt ccagtattag agaagtcgct accggtggcg cacctgttgg aactgaagtg 960

gcagtggccg ttgcgaaacg gttgaaaatt ggcggaatcc ttcagggcta cggattgacc 1020

gaaacgtgtt gcgccgtatt aattacccct catgacgacg ttaaaacagg ttctaccggg 1080

agggtagctc cttacgtcca agcgaaaatt gtagatctta ccaccggaaa atctctgggg 1140

ccaaataaaa gaggagagct ttgttttaaa agtgagatca ttatgaaggg ctatttcaac 1200

aataaacaag ctacggaaga agccatcgat aaagaaggat ggttacattc tggagatgtt 1260

gggtattatg acgacgatgg tcatttcttc gtagtcgatc gtttaaagga acttatcaag 1320

tacaagggat atcaagtagc accggctgaa ctggagtggt tgcttttgca acatccatct 1380

attaaagatg ccggtgttac tggcgttccc gacgaagctg ctggagaact accaggtgct 1440

tgtatagttc tccaagaagg aaaaagtctt actgaacaag aaattattga ctatatagcc 1500

gaacgagttt cgccaactaa acgtatacgt ggtggagtgg tcttcgttga tgatattcct 1560

aaaggggcga ctggaaaact ggtcagaagt gaattacgaa aacttcttgc tcagaagaaa 1620

tcgaaactat aa 1632

<210> 10
<211> 1632
<212> DNA
<213> Mutant Rhagophthalmus ohbai Green Luciferase of the Invention

<400> 10
atggctaacg agatcatcct gcacggcgcc aagcccaggg acccccctgga cctgggcacc 60

gccggcattc agctctacag ggccctgacc aacttctcct tcctgaggga ggccctgatc 120

gacgcccaca ccgaggaggt ggtgtcttac gccgacatcc tggagaacag ctgtagactg 180

gctaagtgct acgagaacta cggcctgcgc cagaacagcg tgatctccgt gtgcagcgag 240

aatagcacca tcttcttcta ccccgtgatc gccgccctgt acatgggcgt gatcaccgcc 300

accgtgaacg acagctacac cgagcgggag ctgctggaga ccctgaacat ctccaagccc 360

gaactggtgt tctgctccaa gaaggccatc aagaacatga tggccctgaa gaggaacgtg 420

aacttcatca agaaggtggt gctgctggac agcaaggagg atatgggcga ggcccagtgc 480

ctgagcaact tcatggcccg gtactccgag cccaacctgg acgtgagaaa cttcaagcca 540

agggacttcg acgccaagga gcaggtggcc cttattatgt cctcctctgg caccaccggc 600

ctgccaaagg gcgtggtgct gacccacagg aacctgagcg tgcgcttcgt ccactgcaag 660

gacccccctgt tcggcaccag aaccatcccc tccacctcca tcctgtccat cgtgcccttc 720

caccacgcct tcggaatgtt cacaaccctg tcctacttca tcgtgggcct gagagtggtg 780

ctgctgaaga gattcgagga gaagttcttc ctgagcacca tcgagaagta cagaatccca 840

acaatcgtgc tggcccctcc tgtgatggtg ttcctggcta agagcccccct ggtggaccag 900

tacgacctgt ccagcatcag agaggtggcc accggcggcg cccctgtggg caccgaggtt 960

gccgtggccg tggccaagcg gctgaagatc ggcggcatcc tccagggcta cggcctgacc 1020

gagacctgct gcgccgtgct gatcaccccc cacgacgacg tgaagaccgg ctccaccggc 1080

agggtagccc cctacgtgca ggctaagatc gtggacctga ccaccggcaa gtccctggga 1140

cctaacaaga gaggcgagct gtgcttcaag agcgagatca tcatgaaggg ctacttcaac 1200

aacaagcagg ccaccgagga ggccatcgac aaggagggct ggctgcactc cggcgacgtg 1260

ggatactacg acgacgatgg acatttcttc gtggtggacc ggctgaaaga gctgatcaag 1320

tacaagggct accaggtggc ccccgccgag ctggagtggc tgctgctcca gcacccatcc 1380

atcaaggatg ccggcgtgac cggcgtgccc gacgaggccg ccggcgagct gcccggcgcc 1440

tgcatcgtgc tccaggaggg caagagcctg accgagcagg agatcatcga ctacatcgcc 1500

gagcgagtgt ctcccaccaa gcgcatccgg ggcggagtcg tcttcgtgga cgacatcccc 1560

aagggcgcca ccggcaagct ggtgagaagc gagctgcgga agctgctggc ccagaagaag 1620

tccaagctgt aa 1632

<210> 11
<211> 1632
<212> DNA
<213> Mutant Rhagophthalmus ohbai Orange Luciferase of the Invention

<400> 11
atggctaacg agatcatcct gcacggcgcc aagcccaggg acccccctgga cctgggcacc 60

gccggcattc agctctacag ggccctgacc aacttctcct tcctgaggga ggccctgatc 120

gacgcccaca ccgaggaggt ggtgtcttac gccgacatcc tggagaacag ctgtagactg 180

gctaagtgct acgagaacta cggcctgcgc cagaacagcg tgatctccgt gtgcagcgag 240

aatagcacca tcttcttcta ccccgtgatc gccgccctgt acatgggcgt gatcaccgcc 300

accgtgaacg acagctacac cgagcgggag ctgctggaga ccctgaacat ctccaagccc 360

gaactggtgt tctgctccaa gaaggccatc aagaacatga tggccctgaa gaggaacgtg 420

aacttcatca agaaggtggt gctgctggac agcaaggagg atatgggcga ggcccagtgc 480

ctgagcaact tcatggcccg gtactccgag cccaacctgg acgtgagaaa cttcaagcca 540

agggacttcg acgccaagga gcaggtggcc cttattatgt cctcctctgg caccaccggc 600

ctgccaaagg gcgtggtgct gacccacagg aacctgagcg tgcgcttcgt ccactgcaag 660

gacccctgt tcggcaacag aaccatcccc tccacctcca tcctgtccat cgtgcccttc 720

caccacgcct tcggaatgtt cacaaccctg tcctacttca tcgtgggcct gagagtggtg 780

ctgctgaaga gattcgagga gaagttcttc ctgagcacca tcgagaagta cagaatccca 840

acaatcgtgc tggcccctcc tgtgatggtg ttcctggcta agagcccccc ggtggaccag 900

tacgacctgt ccagcatcag agaggtggcc accggcggcg cccctgtggg caccgaggtt 960

gccgtggccg tggccaagcg gctgaagatc ggcggcatcc tccagggcta cggcctgacc 1020

gagacctgct gcgccgtgct gatcaccccc cacgacgacg tgaagaccgg ctccaccggc 1080

agggtagccc cctacgtgca ggctaagatc gtggacctga ccaccggcaa gtccctggga 1140

cctaacaaga gaggcgagct gtgcttcaag agcgagatca tcatgaaggg ctacttcaac 1200

aacaagcagg ccaccgagga ggccatcgac aaggagggct ggctgcactc cggcgacgtg 1260

ggatactacg acgacgatgg acatttcttc gtggtggacc ggctgaaaga gctgatcaag 1320

tacaagggct accaggtggc ccccgccgag ctggagtggc tgctgctcca gcacccatcc 1380

atcaaggatg ccggcgtgac cggcgtgccc gacgaggccg ccggcgagct gcccggcgcc 1440

tgcatcgtgc tccaggaggg caagagcctg accgagcagg agatcatcga ctacatcgcc 1500

gagcgagtgt ctcccaccaa gcgcatccgg ggcggagtcg tcttcgtgga cgacatcccc 1560

aagggcgcca ccggcaagct ggtgagaagc gagctgcgga agctgctggc ccagaagaag 1620

tccaagctgt aa 1632

<210> 12
<211> 543
<212> PRT
<213> Wild Type Rhagophthalmus ohbai Green Luciferase

<400> 12

Met Pro Asn Glu Ile Ile Leu His Gly Ala Lys Pro Arg Asp Pro Leu
1 5 10 15

Asp Leu Gly Thr Ala Gly Ile Gln Leu Tyr Arg Ala Leu Thr Asn Phe
20 25 30

Ser Phe Leu Arg Glu Ala Leu Ile Asp Ala His Thr Glu Glu Val Val
35 40 45

Ser Tyr Ala Asp Ile Leu Glu Asn Ser Cys Arg Leu Ala Lys Cys Tyr
50 55 60

Glu Asn Tyr Gly Leu Arg Gln Asn Ser Val Ile Ser Val Cys Ser Glu
65 70 75 80

```
Asn Ser Thr Ile Phe Phe Tyr Pro Val Ile Ala Ala Leu Tyr Met Gly
                85                  90                  95

Val Ile Thr Ala Thr Val Asn Asp Ser Tyr Thr Glu Arg Glu Leu Leu
            100                 105                 110

Glu Thr Leu Asn Ile Ser Lys Pro Glu Leu Val Phe Cys Ser Lys Lys
        115                 120                 125

Ala Ile Lys Asn Met Met Ala Leu Lys Arg Asn Val Asn Phe Ile Lys
    130                 135                 140

Lys Val Val Leu Leu Asp Ser Lys Glu Asp Met Gly Glu Ala Gln Cys
145                 150                 155                 160

Leu Ser Asn Phe Met Ala Arg Tyr Ser Glu Pro Asn Leu Asp Val Arg
                165                 170                 175

Asn Phe Lys Pro Arg Asp Phe Asp Ala Lys Glu Gln Val Ala Leu Ile
            180                 185                 190

Met Ser Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Val Leu Thr
        195                 200                 205

His Arg Asn Leu Ser Val Arg Phe Val His Cys Lys Asp Pro Leu Phe
    210                 215                 220

Gly Thr Arg Thr Ile Pro Ser Thr Ser Ile Leu Ser Ile Val Pro Phe
225                 230                 235                 240

His His Ala Phe Gly Met Phe Thr Thr Leu Ser Tyr Phe Ile Val Gly
                245                 250                 255

Leu Arg Val Val Leu Leu Lys Arg Phe Glu Glu Lys Phe Phe Leu Ser
            260                 265                 270

Thr Ile Glu Lys Tyr Arg Ile Pro Thr Ile Val Leu Ala Pro Pro Val
        275                 280                 285

Met Val Phe Leu Ala Lys Ser Pro Leu Val Asp Gln Tyr Asp Leu Ser
    290                 295                 300
```

```
Ser Ile Arg Glu Val Ala Thr Gly Gly Ala Pro Val Gly Thr Glu Val
305                 310                 315                 320

Ala Val Ala Val Ala Lys Arg Leu Lys Ile Gly Gly Ile Leu Gln Gly
                325                 330                 335

Tyr Gly Leu Thr Glu Thr Cys Cys Ala Val Leu Ile Thr Pro His Asp
            340                 345                 350

Asp Val Lys Thr Gly Ser Thr Gly Arg Val Ala Pro Tyr Val Gln Ala
        355                 360                 365

Lys Ile Val Asp Leu Thr Thr Gly Lys Ser Leu Gly Pro Asn Lys Arg
    370                 375                 380

Gly Glu Leu Cys Phe Lys Ser Glu Ile Ile Met Lys Gly Tyr Phe Asn
385                 390                 395                 400

Asn Lys Gln Ala Thr Glu Glu Ala Ile Asp Lys Glu Gly Trp Leu His
                405                 410                 415

Ser Gly Asp Val Gly Tyr Tyr Asp Asp Asp Gly His Phe Phe Val Val
            420                 425                 430

Asp Arg Leu Lys Glu Leu Ile Lys Tyr Lys Gly Tyr Gln Val Ala Pro
        435                 440                 445

Ala Glu Leu Glu Trp Leu Leu Leu Gln His Pro Ser Ile Lys Asp Ala
    450                 455                 460

Gly Val Thr Gly Val Pro Asp Glu Ala Ala Gly Glu Leu Pro Gly Ala
465                 470                 475                 480

Cys Ile Val Leu Gln Glu Gly Lys Ser Leu Thr Glu Gln Glu Ile Ile
                485                 490                 495

Asp Tyr Ile Ala Glu Arg Val Ser Pro Thr Lys Arg Ile Arg Gly Gly
            500                 505                 510

Val Val Phe Val Asp Asp Ile Pro Lys Gly Ala Thr Gly Lys Leu Val
        515                 520                 525
```

```
Arg Ser Glu Leu Arg Lys Leu Leu Ala Gln Lys Lys Ser Lys Leu
    530                 535                 540
```

<210> 13
<211> 543
<212> PRT
<213> Wild Type Rhagophthalmus ohbai Orange Luciferase

<400> 13

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Met Pro Asn Glu Ile Ile Leu His Gly Ala Lys Pro Arg Asp Pro Leu
1               5                   10                  15

Asp Leu Gly Thr Ala Gly Ile Gln Leu Tyr Arg Ala Leu Thr Asn Phe
            20                  25                  30

Ser Phe Leu Arg Glu Ala Leu Ile Asp Ala His Thr Glu Glu Val Val
        35                  40                  45

Ser Tyr Ala Asp Ile Leu Glu Asn Ser Cys Arg Leu Ala Lys Cys Tyr
    50                  55                  60

Glu Asn Tyr Gly Leu Arg Gln Asn Ser Val Ile Ser Val Cys Ser Glu
65                  70                  75                  80

Asn Ser Thr Ile Phe Phe Tyr Pro Val Ile Ala Ala Leu Tyr Met Gly
                85                  90                  95

Val Ile Thr Ala Thr Val Asn Asp Ser Tyr Thr Glu Arg Glu Leu Leu
            100                 105                 110

Glu Thr Leu Asn Ile Ser Lys Pro Glu Leu Val Phe Cys Ser Lys Lys
        115                 120                 125

Ala Ile Lys Asn Met Met Ala Leu Lys Arg Asn Val Asn Phe Ile Lys
    130                 135                 140

Lys Val Val Leu Leu Asp Ser Lys Glu Asp Met Gly Glu Ala Gln Cys
145                 150                 155                 160

Leu Ser Asn Phe Met Ala Arg Tyr Ser Glu Pro Asn Leu Asp Val Arg
                165                 170                 175

Asn Phe Lys Pro Arg Asp Phe Asp Ala Lys Glu Gln Val Ala Leu Ile
            180                 185                 190
```

```
Met Ser Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Val Leu Thr
        195                 200                 205

His Arg Asn Leu Ser Val Arg Phe Val His Cys Lys Asp Pro Leu Phe
    210                 215                 220

Gly Asn Arg Thr Ile Pro Ser Thr Ser Ile Leu Ser Ile Val Pro Phe
225                 230                 235                 240

His His Ala Phe Gly Met Phe Thr Thr Leu Ser Tyr Phe Ile Val Gly
                245                 250                 255

Leu Arg Val Val Leu Leu Lys Arg Phe Glu Glu Lys Phe Phe Leu Ser
            260                 265                 270

Thr Ile Glu Lys Tyr Arg Ile Pro Thr Ile Val Leu Ala Pro Pro Val
        275                 280                 285

Met Val Phe Leu Ala Lys Ser Pro Leu Val Asp Gln Tyr Asp Leu Ser
    290                 295                 300

Ser Ile Arg Glu Val Ala Thr Gly Gly Ala Pro Val Gly Thr Glu Val
305                 310                 315                 320

Ala Val Ala Val Ala Lys Arg Leu Lys Ile Gly Gly Ile Leu Gln Gly
                325                 330                 335

Tyr Gly Leu Thr Glu Thr Cys Cys Ala Val Leu Ile Thr Pro His Asp
            340                 345                 350

Asp Val Lys Thr Gly Ser Thr Gly Arg Val Ala Pro Tyr Val Gln Ala
        355                 360                 365

Lys Ile Val Asp Leu Thr Thr Gly Lys Ser Leu Gly Pro Asn Lys Arg
    370                 375                 380

Gly Glu Leu Cys Phe Lys Ser Glu Ile Ile Met Lys Gly Tyr Phe Asn
385                 390                 395                 400

Asn Lys Gln Ala Thr Glu Glu Ala Ile Asp Lys Glu Gly Trp Leu His
                405                 410                 415
```

Ser Gly Asp Val Gly Tyr Tyr Asp Asp Asp Gly His Phe Phe Val Val
420 425 430

Asp Arg Leu Lys Glu Leu Ile Lys Tyr Lys Gly Tyr Gln Val Ala Pro
435 440 445

Ala Glu Leu Glu Trp Leu Leu Leu Gln His Pro Ser Ile Lys Asp Ala
450 455 460

Gly Val Thr Gly Val Pro Asp Glu Ala Ala Gly Glu Leu Pro Gly Ala
465 470 475 480

Cys Ile Val Leu Gln Glu Gly Lys Ser Leu Thr Glu Gln Glu Ile Ile
485 490 495

Asp Tyr Ile Ala Glu Arg Val Ser Pro Thr Lys Arg Ile Arg Gly Gly
500 505 510

Val Val Phe Val Asp Asp Ile Pro Lys Gly Ala Thr Gly Lys Leu Val
515 520 525

Arg Ser Glu Leu Arg Lys Leu Leu Ala Gln Lys Lys Ser Lys Leu
530 535 540

<210> 14
<211> 543
<212> PRT
<213> Mutant Rhagophthalmus ohbai Green Luciferase of the Invention

<400> 14

Met Ala Asn Glu Ile Ile Leu His Gly Ala Lys Pro Arg Asp Pro Leu
1 5 10 15

Asp Leu Gly Thr Ala Gly Ile Gln Leu Tyr Arg Ala Leu Thr Asn Phe
20 25 30

Ser Phe Leu Arg Glu Ala Leu Ile Asp Ala His Thr Glu Glu Val Val
35 40 45

Ser Tyr Ala Asp Ile Leu Glu Asn Ser Cys Arg Leu Ala Lys Cys Tyr
50 55 60

Glu Asn Tyr Gly Leu Arg Gln Asn Ser Val Ile Ser Val Cys Ser Glu

65 70 75 80

Asn Ser Thr Ile Phe Phe Tyr Pro Val Ile Ala Ala Leu Tyr Met Gly
85 90 95

Val Ile Thr Ala Thr Val Asn Asp Ser Tyr Thr Glu Arg Glu Leu Leu
100 105 110

Glu Thr Leu Asn Ile Ser Lys Pro Glu Leu Val Phe Cys Ser Lys Lys
115 120 125

Ala Ile Lys Asn Met Met Ala Leu Lys Arg Asn Val Asn Phe Ile Lys
130 135 140

Lys Val Val Leu Leu Asp Ser Lys Glu Asp Met Gly Glu Ala Gln Cys
145 150 155 160

Leu Ser Asn Phe Met Ala Arg Tyr Ser Glu Pro Asn Leu Asp Val Arg
165 170 175

Asn Phe Lys Pro Arg Asp Phe Asp Ala Lys Glu Gln Val Ala Leu Ile
180 185 190

Met Ser Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Val Leu Thr
195 200 205

His Arg Asn Leu Ser Val Arg Phe Val His Cys Lys Asp Pro Leu Phe
210 215 220

Gly Thr Arg Thr Ile Pro Ser Thr Ser Ile Leu Ser Ile Val Pro Phe
225 230 235 240

His His Ala Phe Gly Met Phe Thr Thr Leu Ser Tyr Phe Ile Val Gly
245 250 255

Leu Arg Val Val Leu Leu Lys Arg Phe Glu Glu Lys Phe Phe Leu Ser
260 265 270

Thr Ile Glu Lys Tyr Arg Ile Pro Thr Ile Val Leu Ala Pro Pro Val
275 280 285

Met Val Phe Leu Ala Lys Ser Pro Leu Val Asp Gln Tyr Asp Leu Ser
290 295 300

```
Ser Ile Arg Glu Val Ala Thr Gly Gly Ala Pro Val Gly Thr Glu Val
305                 310                 315                 320

Ala Val Ala Val Ala Lys Arg Leu Lys Ile Gly Gly Ile Leu Gln Gly
                325                 330                 335

Tyr Gly Leu Thr Glu Thr Cys Cys Ala Val Leu Ile Thr Pro His Asp
            340                 345                 350

Asp Val Lys Thr Gly Ser Thr Gly Arg Val Ala Pro Tyr Val Gln Ala
        355                 360                 365

Lys Ile Val Asp Leu Thr Thr Gly Lys Ser Leu Gly Pro Asn Lys Arg
    370                 375                 380

Gly Glu Leu Cys Phe Lys Ser Glu Ile Ile Met Lys Gly Tyr Phe Asn
385                 390                 395                 400

Asn Lys Gln Ala Thr Glu Glu Ala Ile Asp Lys Glu Gly Trp Leu His
                405                 410                 415

Ser Gly Asp Val Gly Tyr Tyr Asp Asp Asp Gly His Phe Phe Val Val
            420                 425                 430

Asp Arg Leu Lys Glu Leu Ile Lys Tyr Lys Gly Tyr Gln Val Ala Pro
        435                 440                 445

Ala Glu Leu Glu Trp Leu Leu Leu Gln His Pro Ser Ile Lys Asp Ala
    450                 455                 460

Gly Val Thr Gly Val Pro Asp Glu Ala Ala Gly Glu Leu Pro Gly Ala
465                 470                 475                 480

Cys Ile Val Leu Gln Glu Gly Lys Ser Leu Thr Glu Gln Glu Ile Ile
                485                 490                 495

Asp Tyr Ile Ala Glu Arg Val Ser Pro Thr Lys Arg Ile Arg Gly Gly
            500                 505                 510

Val Val Phe Val Asp Asp Ile Pro Lys Gly Ala Thr Gly Lys Leu Val
        515                 520                 525
```

Arg Ser Glu Leu Arg Lys Leu Leu Ala Gln Lys Lys Ser Lys Leu
530 535 540

<210> 15
<211> 543
<212> PRT
<213> Mutant Rhagophthalmus ohbai Orange Luciferase of the Invention

<400> 15

Met Ala Asn Glu Ile Ile Leu His Gly Ala Lys Pro Arg Asp Pro Leu
1 5 10 15

Asp Leu Gly Thr Ala Gly Ile Gln Leu Tyr Arg Ala Leu Thr Asn Phe
20 25 30

Ser Phe Leu Arg Glu Ala Leu Ile Asp Ala His Thr Glu Glu Val Val
35 40 45

Ser Tyr Ala Asp Ile Leu Glu Asn Ser Cys Arg Leu Ala Lys Cys Tyr
50 55 60

Glu Asn Tyr Gly Leu Arg Gln Asn Ser Val Ile Ser Val Cys Ser Glu
65 70 75 80

Asn Ser Thr Ile Phe Phe Tyr Pro Val Ile Ala Ala Leu Tyr Met Gly
85 90 95

Val Ile Thr Ala Thr Val Asn Asp Ser Tyr Thr Glu Arg Glu Leu Leu
100 105 110

Glu Thr Leu Asn Ile Ser Lys Pro Glu Leu Val Phe Cys Ser Lys Lys
115 120 125

Ala Ile Lys Asn Met Met Ala Leu Lys Arg Asn Val Asn Phe Ile Lys
130 135 140

Lys Val Val Leu Leu Asp Ser Lys Glu Asp Met Gly Glu Ala Gln Cys
145 150 155 160

Leu Ser Asn Phe Met Ala Arg Tyr Ser Glu Pro Asn Leu Asp Val Arg
165 170 175

Asn Phe Lys Pro Arg Asp Phe Asp Ala Lys Glu Gln Val Ala Leu Ile

```
            180                 185                 190

Met Ser Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Val Leu Thr
        195                 200                 205

His Arg Asn Leu Ser Val Arg Phe Val His Cys Lys Asp Pro Leu Phe
    210                 215                 220

Gly Asn Arg Thr Ile Pro Ser Thr Ser Ile Leu Ser Ile Val Pro Phe
225                 230                 235                 240

His His Ala Phe Gly Met Phe Thr Thr Leu Ser Tyr Phe Ile Val Gly
                245                 250                 255

Leu Arg Val Val Leu Leu Lys Arg Phe Glu Glu Lys Phe Phe Leu Ser
            260                 265                 270

Thr Ile Glu Lys Tyr Arg Ile Pro Thr Ile Val Leu Ala Pro Pro Val
        275                 280                 285

Met Val Phe Leu Ala Lys Ser Pro Leu Val Asp Gln Tyr Asp Leu Ser
    290                 295                 300

Ser Ile Arg Glu Val Ala Thr Gly Gly Ala Pro Val Gly Thr Glu Val
305                 310                 315                 320

Ala Val Ala Val Ala Lys Arg Leu Lys Ile Gly Gly Ile Leu Gln Gly
                325                 330                 335

Tyr Gly Leu Thr Glu Thr Cys Cys Ala Val Leu Ile Thr Pro His Asp
            340                 345                 350

Asp Val Lys Thr Gly Ser Thr Gly Arg Val Ala Pro Tyr Val Gln Ala
        355                 360                 365

Lys Ile Val Asp Leu Thr Thr Gly Lys Ser Leu Gly Pro Asn Lys Arg
    370                 375                 380

Gly Glu Leu Cys Phe Lys Ser Glu Ile Ile Met Lys Gly Tyr Phe Asn
385                 390                 395                 400

Asn Lys Gln Ala Thr Glu Glu Ala Ile Asp Lys Glu Gly Trp Leu His
                405                 410                 415
```

Ser Gly Asp Val Gly Tyr Tyr Asp Asp Asp Gly His Phe Phe Val Val
420 425 430

Asp Arg Leu Lys Glu Leu Ile Lys Tyr Lys Gly Tyr Gln Val Ala Pro
435 440 445

Ala Glu Leu Glu Trp Leu Leu Leu Gln His Pro Ser Ile Lys Asp Ala
450 455 460

Gly Val Thr Gly Val Pro Asp Glu Ala Ala Gly Glu Leu Pro Gly Ala
465 470 475 480

Cys Ile Val Leu Gln Glu Gly Lys Ser Leu Thr Glu Gln Glu Ile Ile
485 490 495

Asp Tyr Ile Ala Glu Arg Val Ser Pro Thr Lys Arg Ile Arg Gly Gly
500 505 510

Val Val Phe Val Asp Asp Ile Pro Lys Gly Ala Thr Gly Lys Leu Val
515 520 525

Arg Ser Glu Leu Arg Lys Leu Leu Ala Gln Lys Lys Ser Lys Leu
530 535 540

<210> 16
<211> 1638
<212> DNA
<213> Mutant Phrixothrix Green Luciferase

<400> 16
atggaagaag agaacatcag gcacggcgag cgccctcggg acatcgtcca ccctggctcc 60

gccggccagc agctgtacca gtccctgtac aagttcgcct ccttccctga ggccatcatc 120

gacgcccaca ccaacgaggt gatctcctac gcccagattt tcgaaaccag ctgccgcctg 180

gccgtgagca tcgagcagta cggcctgaac gagaacaacg tggtgggcgt ctgtagcgag 240

aacaacatca acttcttcaa ccctgtgctg gccgccctgt acctcggcat cccagtggcc 300

acctccaacg atatgtacac cgatggcgag ctgaccggcc acctgaacat ctccaagcca 360

accatcatgt tcagctccaa gaaggccctg cccctgatcc tgagagtgca gcagaacctg 420

agcttcatca agaaggtggt ggtgatcgac agcatgtacg acatcaacgg cgtggagtgc 480

gtgtctacct tcgttgcccg gtacaccgac cacaccttcg acccactgtc cttcacccca 540

aaggacttcg acccccctgga gaagatcgcc ctgatcatgt catcctccgg caccaccggc 600

ctgcctaagg gcgtggtgct gagccacaga agcctgacca tcagattcgt ccacagcagg 660

gaccccatct acggcacccg caccgtgccc cagacctcca tcctgtccct ggtgccattt 720

caccacgcct tcggcatgtt caccaccctg tcctacttcg tggtgggcct gaaggtggtg 780

atgctgaaga agttcgaggg cgccctcttc ctgaagacca tccagaacta caagatccct 840

acaatcgtgg tggcccctcc agtgatggtg ttcctggcta agagcccact ggtggatcag 900

tacgatctgt ccagcctcac cgaggtggct accggcggcg ctcctctggg caaggatgtg 960

gccgaggctg tggccaagag attgaagctg cctggcatca tccagggcta cggcctgacc 1020

gagacctgct gcgctgtgat gatcaccct cacaacgctg tgaagaccgg ctccaccggc 1080

agacccctgc catacatcaa ggctaaggtg ctggataacg ctaccggcaa agccctggga 1140

ccaggcgaga gaggcgagat ttgcttcaag agcgagatga tcatgaaggg ctactacaac 1200

aaccctgagg ccaccatcga caccatcgac aaggatggct ggctgcactc tggcgacatc 1260

ggctactacg acgaggatgg caacttcttc atcgtggatc ggctgaaaga gctgatcaag 1320

tacaagggct accaggtggc ccctgctgag ctggagaact tgcttctgca gcacccaagc 1380

atcgctgatg ccggcgtgac cggcgtgccc gacgagttcg ctggccagct gcctgctgct 1440

tgtgtcgtgc tggagtctgg caagacattg accgagaagg aggtgcaaga tttcatcgcc 1500

gcccaggtga ccccaactaa gcacctgcgg ggcggcgtgg tgttcgtgga cagcatccct 1560

aaaggcccta ccggcaagct gatcagaaag gagctgcggg agattttcgc ccagagagcc 1620

ccaaagtcca agctgtaa 1638

<210> 17
<211> 75
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<213> Phrixothrix Red Luciferase

<400> 17
cagcaggact acaattatat caatcattat ataaatattc ttatattact gacggaataa 60

tcgatgccca tacca 75

<210> 18
<211> 71
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 18

gcaggactac aattatatca atcattatat aaatactcgt atattactga cggaataatc 60

gatgcccata c 71

<210> 19
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 19
caatgaagta atatcatatg ctcaaatatt tgaaacaagt tgccgcttgg cagttagtct 60

agaaaaatat ggcttgg 77

<210> 20
<211> 75
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 20
aatatttgaa accagctgcc gcttggcagt tagtctagag aaatatggct tggatcataa 60

caatgttgtg gcaat 75

<210> 21
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 21
gaaaacaaca tacacttttt tggcccttta attgctgccc tataccaagg aataccaatg 60

gcaacatcaa atgatat 77

<210> 22
<211> 73
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 22
actttttttgg ccctttaatt gctgctttat accaagggat accaatggca acatcaaatg 60

atatgtacac aga 73

<210> 23
<211> 71
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 23
catcaaatga tatgtacaca gaaagggaga tgatcggcca tttgaatata tcgaaaccat 60

gccttatgtt t 71

<210> 24
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 24
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atgtacgata tcaatgg 77

<210> 25
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 25
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gcctttgatc cagtgaa 77

<210> 26
<211> 75
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 26
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atccagtgaa attta 75

<210> 27
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 27
gtatttagct ttgtttcacg ttatactgat cacgcgttcg atccagtgaa atttaaccca 60

aaagagtttg atccctt 77

<210> 28
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 28
tttaacccaa aagagtttga tcccttggaa agaaccgcgc taattatgac atcatctgga 60

acaactggat tgcctaa 77

<210> 29
<211> 81
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 29
gaaccgcatt aattatgaca tcatctggaa caactggcct gcctaaaggg gtagtaataa 60

gccatagaag tataactata a 81

<210> 30
<211> 73
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 30
ctggattgcc taaaggggta gtaataagcc ataggagtat aactataaga ttcgtccata 60

gcagtgatcc cat 73

<210> 31
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 31
aagaaatttg agggcgaatt cttcttaaaa accatccaaa attacaaaat cgcttctatt 60

gtagttcctc ctccaat 77

<210> 32
<211> 71
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 32
agggcgaatt cttcttaaaa accatacaaa actacaaaat cgcttctatt gtagttcctc 60

ctccaattat g 71

<210> 33
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 33
gttcctcctc caattatggt atatttggct aaaagtcctc tagtcgatga atacaattta 60

tcgagcttaa cggaaat 77

<210> 34

<211> 73
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 34
tttggctaaa agtccattag tcgatgaata caatctgtcg agcttaacgg aaattgcttg 60

tggagggtct cct 73

<210> 35
<211> 73
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 35
ggaaattgct tgtggagggt ctcctttagg aagagacatc gcagataaag tagcaaagag 60

attgaaagta cat 73

<210> 36
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 36
gggtctcctt taggaagaga tatcgcagat aaagtagcca agagattgaa agtacatgga 60

atcctacaag gatatgg 77

<210> 37
<211> 73
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<213> Phrixothrix Red Luciferase

<400> 37
ggatatggat taaccgaaac ctgcagcgct ctaatactga gccccaatga tcgagaactt 60

aaaaaaggtg caa 73

<210> 38
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 38
ccgaaacctg cagcgctcta atacttagcc ccaacgatag agaacttaaa aaaggtgcaa 60

ttggaacgcc tatgcca 77

<210> 39
<211> 81
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<213> Phrixothrix Red Luciferase

<400> 39
ctaatactta gccccaatga tcgagaactt aaaaagggtg caattggaac gcctatgcca 60

tatgttcaag ttaaagttat a 81

<210> 40
<211> 73
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 40
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gaaaggatat cac 73

<210> 41
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 41
aaaaggcgaa atatgcttca aaagtcaaat gcttatgaag ggctatcaca acaatccgca 60

agcaactcgt gatgctc 77

<210> 42
<211> 75
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 42
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atattacgac gaaga 75

<210> 43
<211> 73
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 43
gacagattta tctatgtagt tgatcgattg aaagagctta ttaaatataa aggatatcag 60

gttgcgcctg ctg 73

<210> 44
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 44
atttatctat gtagttgatc gattgaaaga actcatcaaa tataaaggat atcaggttgc 60

gcctgctgaa ctggaaa 77

<210> 45
<211> 75
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 45
cgcctgctga actggaaaat ctgcttttac aacacccaaa tatttctgat gcgggtgtta 60

ttggaattcc ggacg 75

<210> 46
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 46
ctgaactgga aaatctgctt ttacaacatc ctaatatttc tgatgcgggt gttattggaa 60

ttccggacga atttgct 77

<210> 47
<211> 75
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 47
ttacaacatc caaatatttc tgatgcgggt gtcattggaa ttccggacga atttgctggt 60

caattacctt ccgcg 75

<210> 48
<211> 77
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 48
tgcgggtgtt attggaattc cggacgaatt tgctggtcag ttaccttccg cgtgtgttgt 60

gttagagcct ggtaaga 77

<210> 49
<211> 73
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 49
aactaaacat cttcgaggcg gtgtcgtatt tatcgacagt attccaaaag gcccaacagg 60

aaaactcatg aga 73

<210> 50
<211> 48
<212> DNA
<213> Phrixothrix Red Luciferase

<400> 50
gaactccgtg caatatttgc ccgggaacag gcaaaatcaa aactataa 48

<210> 51
<211> 77
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 51
cccagggacc ccctggacct gggcaccgcc ggcattcagc tctacagagc cctgaccaac 60

ttctccttcc tgaggga 77

<210> 52
<211> 77
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 52
cctgggcacc gccggcatcc agctgtacag ggccctgacc aacttctcct tcctgaggga 60

ggccctgatc gacgccc 77

<210> 53
<211> 79
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 53
gtggtgtctt acgccgacat cctggagaac agctgtagac tggctaagtg ctacgagaac 60

tacggcctgc gccagaaca 79

<210> 54
<211> 79
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 54
gcgccagaac agcgtgatct ccgtgtgcag cgagaatagc accatcttct tctaccccgt 60

gatcgccgcc ctgtacatg 79

<210> 55
<211> 81
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 55
tcaagaaggt ggtgctgctg gacagcaagg aggatatggg cgaggcccag tgcctgagca 60

acttcatggc ccggtactcc g 81

<210> 56
<211> 81
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 56
tcaagccaag ggacttcgac gccaaggagc aggtggccct tattatgtcc tcctctggca 60

ccaccggcct gccaaagggc g 81

<210> 57
<211> 75
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 57
atcgagaagt acagaatccc aacaatcgtg ctggcccctc ctgtgatggt gttcctggcc 60

aagagccccc tggtg 75

<210> 58
<211> 79
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 58
atcccaacaa tcgtgctggc ccccccccgtg atggtgttcc tggctaagag ccccctggtg 60

gaccagtacg acctgtcca 79

<210> 59
<211> 75
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 59
gagaggtggc caccggcggc gcccctgtgg gcaccgaggt tgccgtggcc gtggccaagc 60

ggctgaagat cggcg 75

<210> 60
<211> 75

<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 60
gccatcgaca aggagggctg gctgcactcc ggcgacgtgg gatactacga cgacgatggc 60

cacttcttcg tggtg 75

<210> 61
<211> 73
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 61
ctccggcgac gtgggctact acgacgacga tggacatttc ttcgtggtgg accggctgaa 60

ggagctgatc aag 73

<210> 62
<211> 81
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 62
cgacgatggc cacttcttcg tggtggaccg gctgaaagag ctgatcaagt acaagggcta 60

ccaggtggcc cccgccgagc t 81

<210> 63
<211> 71
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 63
agtggctgct gctccagcac ccatccatca aggatgccgg cgtgaccggc gtgcccgacg 60

aggccgccgg c 71

<210> 64
<211> 75
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 64
ccgagcagga gatcatcgac tacatcgccg agcgagtgtc tcccaccaag cgcatccggg 60

gcggcgtcgt cttcg 75

<210> 65
<211> 71
<212> DNA
<213> Rhagophthalmus ohbai Green Luciferase

<400> 65
gagcgggtgt cccccaccaa gcgcatccgg ggcggagtcg tcttcgtgga cgacatcccc 60

aagggcgcca c 71